

TOBACCO AND CANCER IN TEXAS 2001–2005



Texas Department of State Health Services
Texas Cancer Registry



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Introduction

Tobacco use remains the leading cause of preventable disease and deaths in the United States and Texas, causing more deaths than alcohol, AIDS, automobile crashes, homicide, suicide, and illegal drug use combined.⁽¹⁾ Tobacco use has long been associated with significant health problems such as heart disease, stroke, emphysema, diabetes, and particularly cancer. The first modern studies linking tobacco use and lung cancer were published in the 1950's.⁽²⁾ Since that time, numerous studies have been conducted examining potential harmful health effects from the use of tobacco.



In 2004, the U.S. Surgeon General released, “The Health Consequences of Smoking: A Report of the Surgeon General” that concluded that cigarette smoking is conclusively linked to lung, oral cavity and pharynx, larynx, esophagus, bladder, pancreas, kidney, cervix, stomach, and acute myeloid leukemia cancers.⁽³⁾ In addition, there was evidence indicating a possible causal relationship between smoking and cancers of the colon, rectum, and liver. Other tobacco products, including chewing tobacco, snuff, and cigars remain strong risk factors for many of these same types of cancer, especially mouth and throat cancers. It is estimated that 30% or more of cancer deaths could be prevented if tobacco use was eliminated.⁽⁴⁾

Passive exposure to smoking is also of great concern. Secondhand smoke is a known carcinogen, and secondhand smoke is estimated to cause 3,000 lung cancer deaths among nonsmokers in the U.S. each year.⁽⁵⁾ In 2006, the U.S. Surgeon General released “The Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report of the Surgeon General”, which concluded that secondhand smoke is causally related to lung, breast, cervix and nasopharyngeal cancers.⁽⁶⁾

This report describes the impact of tobacco-related cancers on Texas from 2001–2005 and what is expected in 2008. This includes all the cancers determined to be conclusively linked to tobacco use by the 2004 Surgeon General's report. It must be noted that not all of the cancer diagnoses described in this report can be attributed to tobacco use but this report summarizes the burden of cancers in which tobacco use is a strong risk factor. A basic description of each cancer is provided, the number of Texans newly diagnosed and deceased, as well as which race and ethnic populations are most affected.

Overview of Tobacco-Related Cancers in Texas

It is estimated that in 2008, 28,664 Texans were newly diagnosed and 18,238 died from cancers of the lung, oral cavity and pharynx, larynx, esophagus, bladder, pancreas, kidney, cervix, stomach, and acute myeloid leukemia cancers (Table I). From 2001–2005, these cancers accounted for over 31% of all newly diagnosed cancers and 47% of all cancer deaths.

Incidence rates among Texans are higher for lung, oral cavity, laryngeal, kidney, and cervical cancers when compared with the U.S. Surveillance and Epidemiology End Results Program (SEER) (Figure 1). Mortality rates are also higher in Texas than the U.S. for oral cavity, kidney, stomach, and cervical cancers (Figure 2).⁽⁷⁾

Racial and ethnic disparities exist in relation to tobacco-related cancers. Blacks in Texas bear a disproportionate burden of these cancers, experiencing the highest incidence for five of the ten tobacco-related cancers (lung, larynx, esophagus, stomach, and pancreas) examined in this report. Even more disconcerting is that blacks also experienced

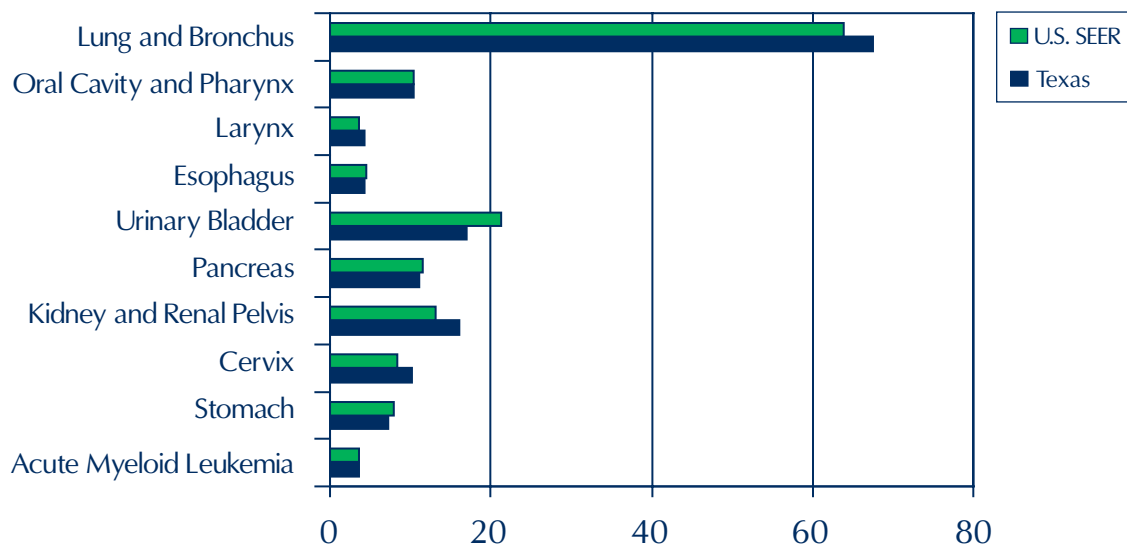
the highest mortality for all but three of the ten tobacco-related cancers. Blacks had higher rates of mortality from cancers of the lung, oral cavity and pharynx, larynx, esophagus, pancreas, cervix and stomach when compared with other Texas race and ethnic groups.

Table 1. Expected New Tobacco-Related Cancer Cases and Deaths by Primary Site, Texas, 2008

Cancer Site	Expected New Cases			Expected Deaths		
	Total	Male	Female	Total	Male	Female
All Tobacco-Related Sites Combined	28,664	16,816	11,876	18,238	10,872	7,366
Lung and Bronchus	12,117	6,498	5,619	10,822	6,448	4,374
Oral Cavity and Pharynx	2,269	1,569	700	574	416	158
Larynx	698	568	131	291	240	51
Esophagus	903	682	221	794	618	176
Urinary Bladder	4,079	3,097	982	746	509	237
Pancreas	2,329	1,163	1,166	2,069	1,070	1,000
Kidney/Renal Pelvis	2,662	1,705	957	1,017	656	361
Cervix	1,081	0	1,081	397	0	397
Stomach	1,742	1,069	673	983	602	381
Acute Myeloid Leukemia	784	438	346	545	313	231

New cancer cases were estimated by applying California 2000–2004 age-, sex-, and race/ethnic-specific average annual incidence rates to the corresponding Texas 2008 population. Cancer deaths were estimated by applying Texas 2003–2004 age-, sex-, and race/ethnic-specific average annual mortality rates to the corresponding Texas 2008 population. Totals may not sum due to rounding.

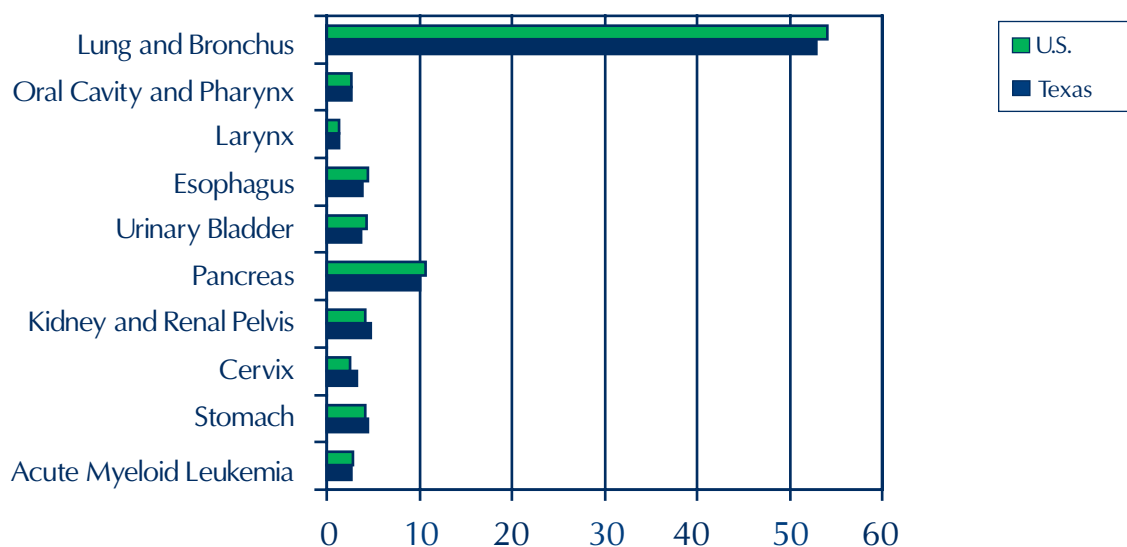
Figure 1. Tobacco-Related Cancer Incidence Rates, Texas and U.S. SEER, 2001–2005



Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.

Source: Texas Department of State Health Services, Cancer Epidemiology and Surveillance Branch, 1995–2005 incidence file as of 1/31/2008.
SEER Cancer Statistics Review, 1975–2005.

Figure 2. Tobacco-Related Cancer Mortality Rates, Texas and U.S., 2001–2005



Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.

Source: Texas: Texas Department of State Health Services, Center for Health Statistics; SEER, Cancer Statistics Review, 1975–2005; SEER Program Public Use Mortality Data (1969–2005) for AML.

Lung and Bronchial Cancer, Texas, 2001–2005

Texans Newly Diagnosed: 62,063
Highest Diagnosis Rate: Black Men

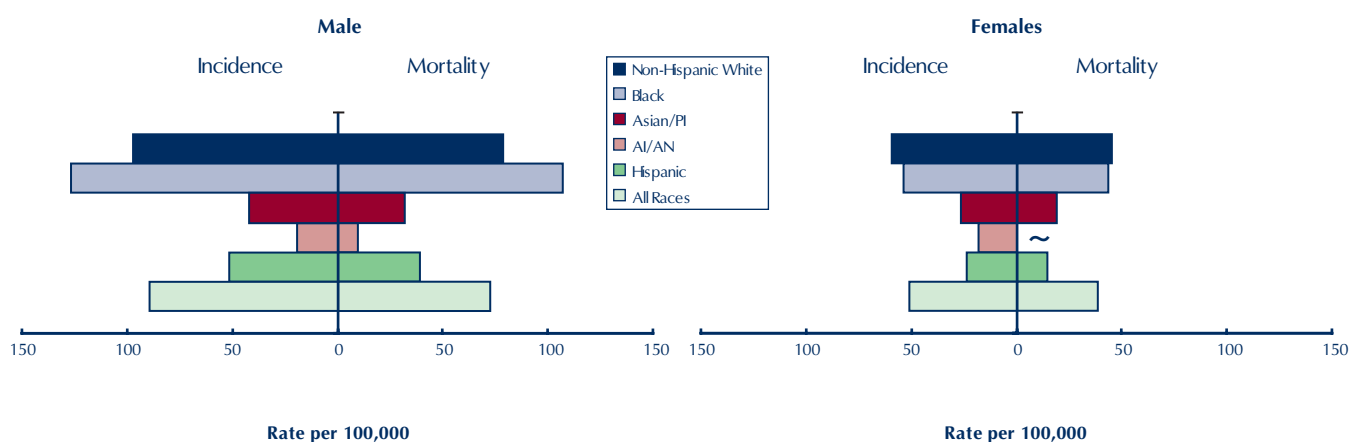
Texan Lives Lost: 48,184
Highest Death Rate: Black Men

The association between lung cancer and smoking is well documented, and based on the “2004 U.S. Surgeon General’s Report on the Health Consequences of Smoking”, it is estimated that almost 90% of lung cancer deaths are due to smoking.⁽³⁾ Rarely detected at an early, treatable stage, lung cancer is one of the most difficult cancers to treat and very often fatal. Overall, only 17% of people diagnosed with lung cancer are alive five years later, and nearly 60% of patients die within one year of diagnosis.⁽⁷⁾

The best protection against lung cancer is to never begin smoking. It has been repeatedly shown that nonsmokers have much lower rates of lung cancer as well as other smoking-related cancers. However, the argument that “it’s too late to quit smoking” because the damage has already been done is simply not true. While ex-smokers are still at a higher risk of lung cancer than nonsmokers, this risk declines with each year of not smoking. After ten years, the risk among ex-smokers begins to approach that of nonsmokers.^(8,9)

The American Cancer Society estimates 215,020 new cases of lung cancer were diagnosed in the U.S. in 2008, and an estimated 161,840 people died of these cancers in that same year.⁽¹⁰⁾ For Texas in the same year, it is estimated that 12,117 new cases of lung cancer and 10,822 deaths occurred. Lung cancer is the leading cause of cancer death among Texas men and women, and the second most commonly diagnosed cancer. Although lung cancer mortality rates in Texas continue to decline slightly, the total number of deaths and new cases diagnosed continues to climb as our population increases and ages. Black men bear an especially large lung cancer burden. Black men in Texas had the highest incidence rate of lung cancer among all racial and ethnic groups for the years 2001–2005. In addition, black men had almost three times the mortality rate of Hispanic men, and over 35% higher mortality than non-Hispanic whites. Among women, non-Hispanic whites had both the highest incidence and the highest mortality rates from lung cancer, with rates over twice as high as Hispanic women.

Figure 3. Lung and Bronchial Cancer, by Sex, Race, and Ethnicity, Texas, 2001–2005



~ Rate is not shown if number of cases or deaths is fewer than 16.

Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.

Incidence Source: Texas Department of State Health Services, Cancer Epidemiology and Surveillance Branch, 1995–2005 Incidence file as of 01/25/08.
Mortality Source: Texas Department of State Health Services, Center for Health Statistics.

Oral Cavity and Pharyngeal Cancer, Texas, 2001–2005

Texans Newly Diagnosed: 10,189
Highest Diagnosis Rate: Non-Hispanic White Men

Texan Lives Lost: 2,544
Highest Death Rate: Black Men

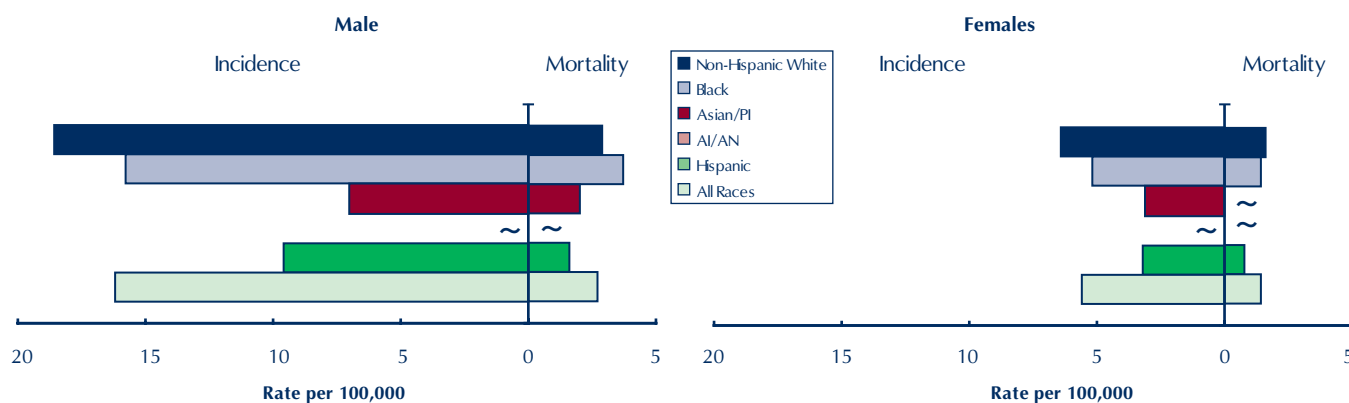
While tobacco use is most often associated with lung cancer, it is also a major risk factor for cancers of the head and neck. Two of the most common tobacco-related sites for cancers of the head and neck are the oral cavity (tongue and mouth) and pharynx (throat). Using tobacco products increases the likelihood of getting head and neck cancer up to 10 or more times than that of someone who does not use tobacco.⁽¹¹⁾ Almost 90% of people with cancers of the oral cavity or pharynx report use of tobacco products.⁽¹²⁾ Importantly, research has shown that the risk of developing oral and pharyngeal cancer declines rapidly after quitting smoking with little to no elevated risk among former smokers after ten years.⁽¹³⁾

All tobacco use is a major risk factor for oral and pharyngeal cancer but some people believe that smokeless tobacco is still a “safe” alternative to smoking. In 1986, the U.S. Surgeon General released a report specifically addressing the dangers of smokeless tobacco, warning that smokeless tobacco use represented a significant health risk. This is especially true when examining cancers of the oral cavity. The risk of cancer of the cheek and gums is almost 50 times higher among long-term smokeless tobacco users.⁽¹⁴⁾

The prognosis for cancers of the oral cavity and pharynx is not good. The five-year survival rate is only 62%, and only 50% are still alive after ten years.⁽¹⁰⁾ The treatment plan for oral cancers is usually surgery and sometimes radiation therapy. The surgery can be quite disfiguring to the face, particularly for advanced cancer.

The American Cancer Society estimates 35,310 new cases of oral and pharyngeal cancer were diagnosed in the U.S. in 2008, and an estimated 7,590 people died of these cancers in that same year.⁽¹⁰⁾ In Texas alone there were 2,269 new cases of oral and pharyngeal cancer estimated for 2008, and 574 deaths. Among men in Texas, non-Hispanic whites had the highest incidence and blacks the highest mortality rates from oral and pharyngeal cancer. Mortality rates for black men were over twice that of Hispanics and over 50% higher than non-Hispanic whites. Among women, non-Hispanic whites had both the highest incidence and highest mortality rates from oral and pharyngeal cancer. The incidence and mortality rates in non-Hispanic whites were twice as high as the rates in Hispanic women.

Figure 4. Oral Cavity and Pharyngeal Cancer, by Sex, Race, and Ethnicity, Texas, 2001–2005



~ Rate is not shown if number of cases or deaths is fewer than 16.

Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.

Incidence Source: Texas Department of State Health Services, Cancer Epidemiology and Surveillance Branch, 1995–2005 Incidence file as of 01/25/08.

Mortality Source: Texas Department of State Health Services, Center for Health Statistics.

Laryngeal Cancer, Texas, 2001–2005

Texans Newly Diagnosed: 3,979
Highest Diagnosis Rate: Black Men

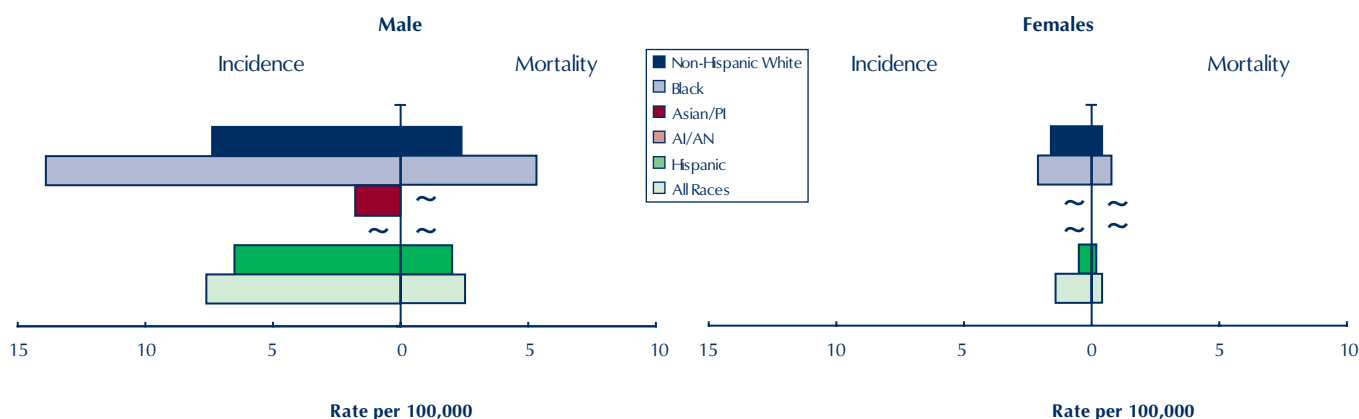
Texan Lives Lost: 1,218
Highest Death Rate: Black Men

The larynx (voicebox) is located just below the throat in the neck and plays a key role in breathing, swallowing, and talking. The larynx is another common head and neck cancer associated with tobacco use. Smoking is a major risk factor for cancer of the larynx, and the more one smokes, the greater the risk. Smokers have up to ten times the risk for laryngeal cancers than do nonsmokers. Additionally, the risk of laryngeal cancer is even greater among people who drink alcohol in addition to using tobacco.⁽¹⁵⁾

The overall five-year survival rate for laryngeal cancer is 63.7% (1996-2004 data).⁽⁷⁾ However, with almost all treatments for laryngeal cancer, patients generally need therapy to help with speech and swallowing.

The American Cancer Society estimates there were 12,250 new cases of laryngeal cancer diagnosed in the U.S. in 2008, and 3,670 deaths.⁽¹⁰⁾ It is estimated that for Texas, there were 698 new cases and 291 deaths due to laryngeal cancer for that same year. In Texas, black men had twice the occurrence of laryngeal cancer than Hispanics, and over 85% more than non-Hispanic whites for the years 2001–2005. Black men were also twice as likely to die from laryngeal cancer as non-Hispanic whites. Among women, blacks have the highest incidence and highest mortality rates from laryngeal cancer—over 30% higher incidence and 80% higher mortality than the rates in non-Hispanic whites.

Figure 5. Laryngeal Cancer, by Sex, Race, and Ethnicity, Texas, 2001–2005



~ Rate is not shown if number of cases or deaths is fewer than 16.

Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.

Incidence Source: Texas Department of State Health Services, Cancer Epidemiology and Surveillance Branch, 1995–2005 Incidence file as of 01/25/08.
Mortality Source: Texas Department of State Health Services, Center for Health Statistics.

Esophageal Cancer, Texas, 2001–2005

Texans Newly Diagnosed: 4,022
Highest Diagnosis Rate: Black Men

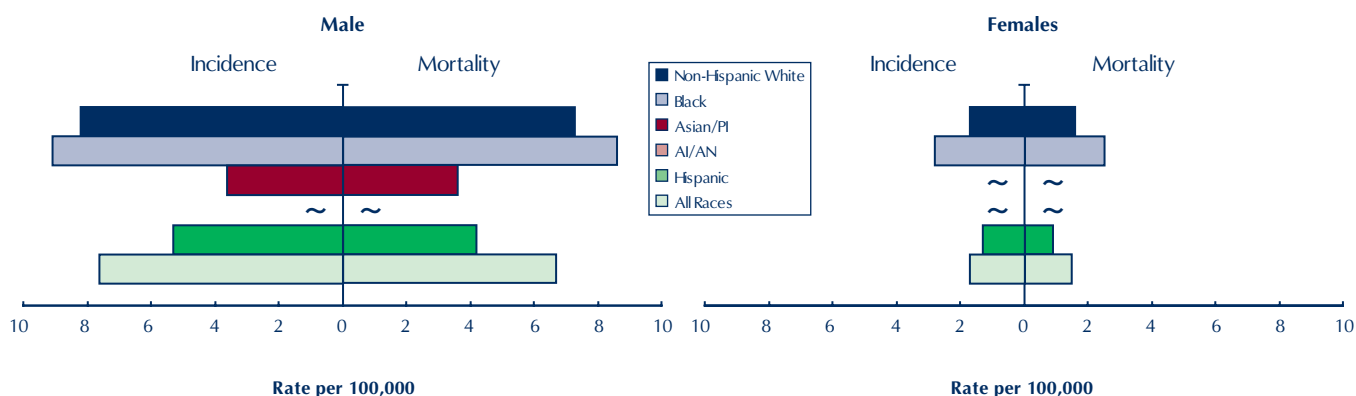
Texan Lives Lost: 3,484
Highest Death Rate: Black Men

Another cancer strongly associated with tobacco use is esophageal cancer. The esophagus is the tube that carries food from the mouth to the stomach. Cigarette smoking and alcohol use are the most common risk factors associated with esophageal cancer. Both factors are independently associated with esophageal cancer and pose an even greater risk when combined. In the U.S. it is estimated that 90% or more of the risk of esophageal cancer can be attributed to tobacco and alcohol and over 50% of esophageal cancer deaths can be attributed to smoking alone.⁽¹⁶⁾

Esophageal cancer is a very deadly disease and is rarely curable. The overall five-year survival rate is only 20%. Even if diagnosed early (localized stage), only 24% will survive for five years.⁽⁷⁾

In the U.S., the American Cancer Society estimates that there were 16,470 new cases of this cancer in 2008 and 14,280 people died of the disease.⁽¹⁰⁾ It is estimated that 903 new cases of esophageal cancer were diagnosed in Texas and 794 deaths occurred. For the years 2001–2005, black men in Texas had the highest incidence and mortality rates of esophageal cancer when compared to Hispanics and non-Hispanic whites. Among women, blacks also have the highest incidence and mortality rates from esophageal cancer. Their incidence rates are over 60% higher and their mortality rates over 50% higher than the rates in non-Hispanic whites.

Figure 6. Esophageal Cancer, by Sex, Race, and Ethnicity, Texas, 2001–2005



~ Rate is not shown if number of cases or deaths is fewer than 16.

Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.

Incidence Source: Texas Department of State Health Services, Cancer Epidemiology and Surveillance Branch, 1995–2005 Incidence file as of 01/25/08.
Mortality Source: Texas Department of State Health Services, Center for Health Statistics.

Urinary Bladder Cancer, Texas, 2001–2005

Texans Newly Diagnosed: 15,366
Highest Diagnosis Rate: Non-Hispanic White Men

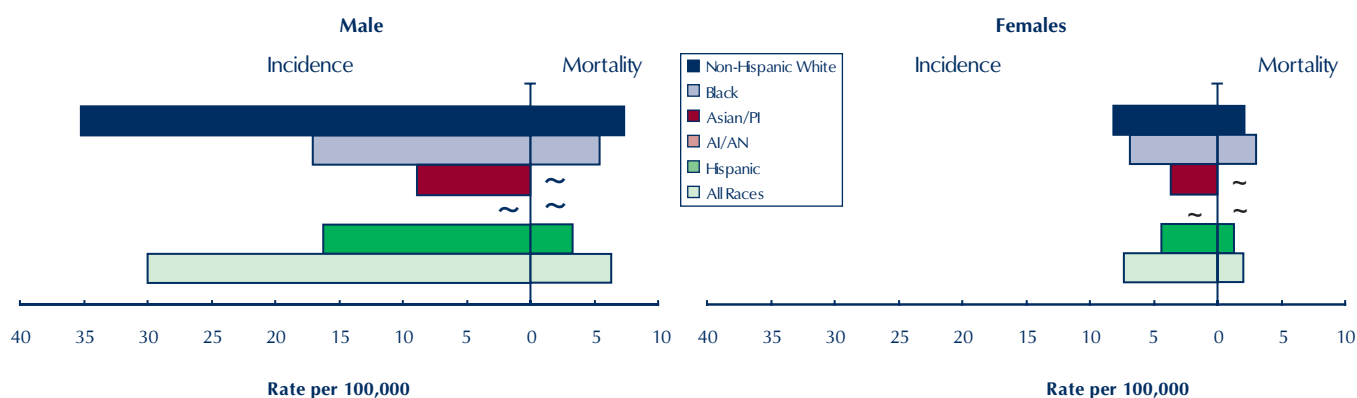
Texan Lives Lost: 3,279
Highest Death Rate: Non-Hispanic White Men

Smoking is an important risk factor for bladder cancer.⁽¹⁰⁾ Cigarette smoking increases the risk of bladder cancer three times that of a nonsmoker, and may be responsible for as much as 60% of bladder cancer cases.⁽¹⁷⁾ Research has shown up to a 60% reduction in bladder cancer risk for smokers who quit, with an almost immediate reduction in risk upon quitting.⁽¹⁸⁾

The overall five-year survival rate for bladder cancer is 82%. When detected at an early stage, the five-year survival rate is as high as 93%. Early detection is critical, as once bladder cancer progresses to a late stage, five-year survival drops to only 6%.⁽⁷⁾

The American Cancer Society estimates that 68,810 new cases of bladder cancer were diagnosed in the U.S. during 2008, and 14,100 people died of the disease.⁽¹⁰⁾ In Texas, there were an estimated 4,079 new cases of bladder cancer diagnosed in 2008 and 746 deaths. For the years 2001–2005, non-Hispanic white men had the highest incidence and mortality of bladder cancer. Among women, non-Hispanic whites had the highest incidence, but blacks the highest mortality rate from urinary bladder cancer. The incidence rate in non-Hispanic white women was over 20% higher than in blacks but mortality in black women was over 40% higher than in non-Hispanic whites.

Figure 7. Urinary Bladder Cancer by Sex, Race, and Ethnicity, Texas, 2001–2005



~ Rate is not shown if number of cases or deaths is fewer than 16.

Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.

Incidence Source: Texas Department of State Health Services, Cancer Epidemiology and Surveillance Branch, 1995–2005 Incidence file as of 01/25/08.

Mortality Source: Texas Department of State Health Services, Center for Health Statistics.

Pancreatic Cancer, Texas, 2001–2005

Texans Newly Diagnosed: 10,075
Highest Diagnosis Rate: Black Men

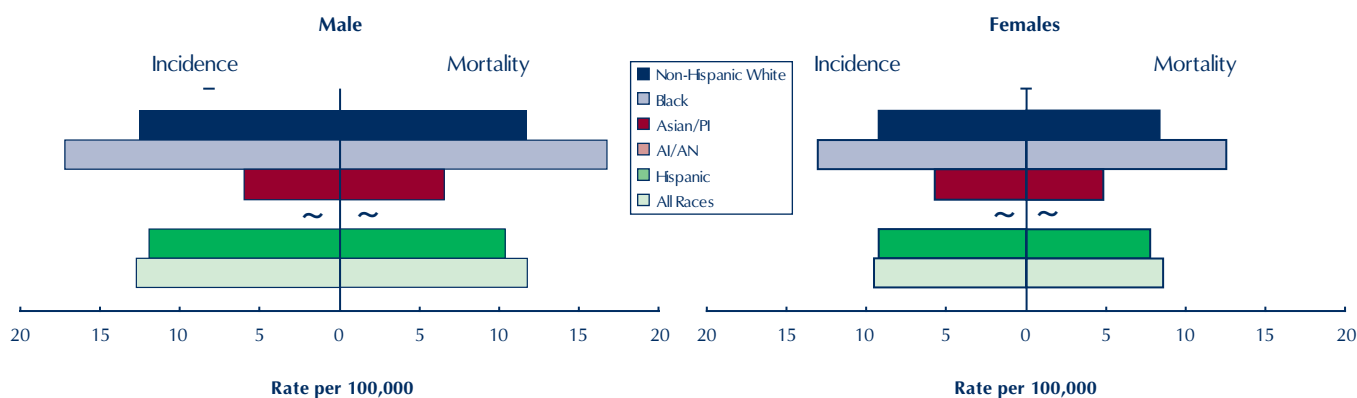
Texan Lives Lost: 9,158
Highest Death Rate: Black Men

The pancreas is a large gland located behind the stomach deep inside the body cavity. The pancreas is very important, as it functions in both digestion and the production of hormones, such as insulin. Smoking is a very important risk factor for cancer of the pancreas. Pancreatic cancer rates for smokers are more than twice that of nonsmokers, and heavy smokers have been shown to have six times the risk. Smokers who quit also reduce the risk of pancreatic cancer. Studies have shown little to no difference in risk between nonsmokers and long-term ex-smokers.⁽¹⁹⁾

While not as common as other cancers, pancreatic cancer is one of the most deadly. The survival rates for pancreatic cancer are among the worst for any cancer. Only 5% of newly diagnosed cases survive five years, and only 25% even survive the first year.⁽⁷⁾ Pancreatic cancer is rarely diagnosed at an early stage, as there are usually no symptoms during the early course of the disease. As a result, only 10 to 20% of patients are candidates for surgical treatment, which offers the best chance of a cure.⁽²⁰⁾

The American Cancer Society estimates that 37,680 new cases of pancreatic cancer were diagnosed in the U.S. during 2008, and 34,290 died of the disease.⁽¹⁰⁾ In Texas there were 2,329 estimated cases of pancreatic cancer diagnosed in 2008 and 2,069 deaths. Black men in Texas had the highest incidence and mortality rates of pancreatic cancer when compared to Hispanic and non-Hispanic whites for the years 2001–2005. Among women, blacks had the highest incidence and mortality rates from pancreatic cancer with a 30% higher incidence and 40% higher mortality than in non-Hispanic whites.

Figure 8. Pancreatic Cancer by Sex, Race, and Ethnicity, Texas, 2001–2005



~ Rate is not shown if number of cases or deaths is fewer than 16.

Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.

Incidence Source: Texas Department of State Health Services, Cancer Epidemiology and Surveillance Branch, 1995–2005 Incidence file as of 01/25/08.
Mortality Source: Texas Department of State Health Services, Center for Health Statistics.

Kidney and Renal Pelvis Cancer, Texas, 2001–2005

Texans Newly Diagnosed: 15,368
Highest Diagnosis Rate: Black Men

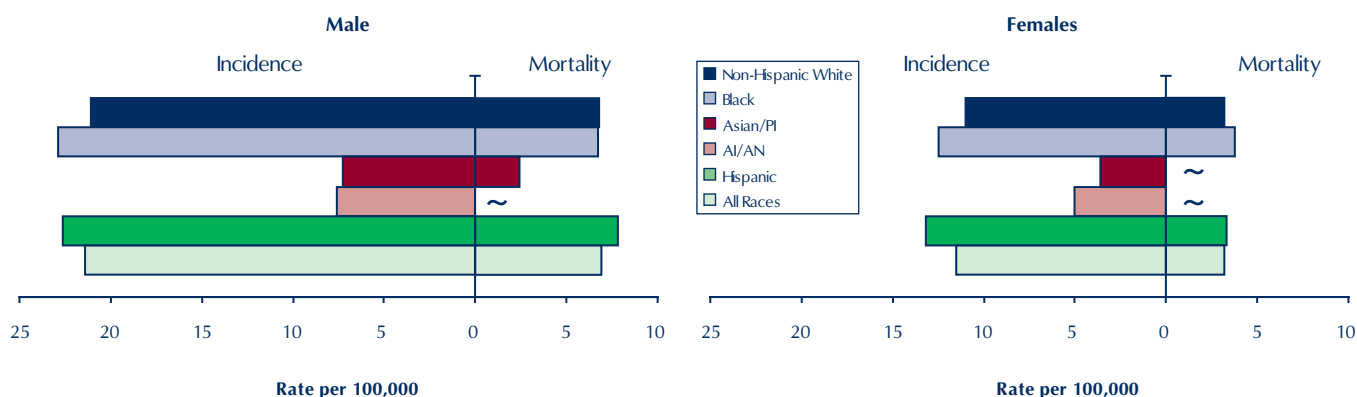
Texan Lives Lost: 4,484
Highest Death Rate: Hispanic Men

Tobacco use is a major risk factor for kidney cancer. The harmful chemicals in tobacco are absorbed into the bloodstream, and can become highly concentrated in the kidneys. Research shows that smokers are more likely to develop kidney cancer than nonsmokers, and heavy smokers may be at two to two and a half-times the risk. In addition, the longer a person smokes, the higher the risk. The risk of kidney cancer decreases for those who quit smoking.⁽²¹⁾

The overall five-year survival rate for kidney cancer is 67%. As with most cancers, the earlier the disease is detected, the better the outcome. The five-year survival rate for those with kidney cancer diagnosed and treated in the early stages is 90%.⁽⁷⁾

The American Cancer Society estimates that 54,390 new cases of kidney cancer were diagnosed in the U.S. during 2008 and over 13,010 died of the disease.⁽¹⁰⁾ In Texas, it is estimated that 2,662 new cases of kidney cancer were diagnosed in 2008 and 1,017 deaths occurred. Men had twice the incidence and mortality of kidney cancer compared to women, both in the U.S. and Texas.⁽⁷⁾ Black men in Texas had the highest incidence rate of kidney and renal pelvis cancer and Hispanics the highest mortality rate. Among women, Hispanics had the highest incidence rates and blacks the highest mortality rates from kidney cancer.

Figure 9. Kidney and Renal Pelvis Cancer by Sex, Race, and Ethnicity, Texas, 2001–2005



~ Rate is not shown if number of cases or deaths is fewer than 16.

Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.

Incidence Source: Texas Department of State Health Services, Cancer Epidemiology and Surveillance Branch, 1995–2005 Incidence file as of 01/25/08.
Mortality Source: Texas Department of State Health Services, Center for Health Statistics.

Cervical Cancer, Texas, 2001–2005

Texans Newly Diagnosed: 5,415
Highest Diagnosis Rate: Hispanic Women

Texan Lives Lost: 1,710
Highest Death Rate: Black Women

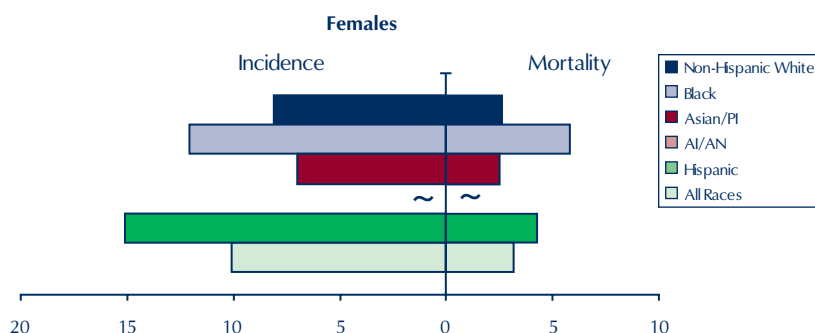
The cervix is the lower part of the uterus and connects the uterus to the vagina. Cervical cancer develops very slowly. In the early stages, some cells begin to change and become abnormal. These changes may not be true cancer, but have the potential to develop into cancer if left untreated. These early abnormal cells can be detected by routine Pap tests. As a result, cervical cancer is among the most preventable of all cancers.

While not as commonly associated with tobacco use as other cancers, women who smoke are twice as likely as nonsmokers to get cervical cancer. The harmful chemicals in tobacco are absorbed by the bloodstream, carried to other parts of the body, and have been found in the cervical mucus of women who smoke. Researchers are still studying how these substances damage the DNA of cells in the cervix and may contribute to the development of cervical cancer.⁽²²⁾

Mortality due to cervical cancer in the U.S. has significantly decreased over the past decades, mainly due to tests that can detect cervical cancer at an early stage.⁽²³⁾ The five-year survival rate for pre-invasive lesions is almost 100%, and is over 92% for all early-stage cervix cancers.⁽⁷⁾ Yet, the American Cancer Society estimates that 3,870 women in the U.S. died in 2008 from cervical cancer.⁽¹⁰⁾

The American Cancer Society estimates that over 11,070 new cases of invasive cervical cancer were diagnosed in the U.S. during 2008 and there were 3,870 deaths.⁽¹⁰⁾ In Texas, it is estimated that 1,081 cases were diagnosed and 397 died in that same year. For the years 2001–2005, Hispanic women in Texas had the highest incidence of cervical cancer, followed closely by blacks. These rates were over 80% and 50% higher than non-Hispanic white women, respectively. Between 2001 and 2005, 1,710 women in Texas died of cervical cancer, with the highest mortality rate among blacks — a rate over 2.3 times higher than non-Hispanic whites.

Figure 10. Cervical Cancer by Race and Ethnicity, Texas, 2001–2005



~ Rate is not shown if number of cases or deaths is fewer than 16.

Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.

Incidence Source: Texas Department of State Health Services, Cancer Epidemiology and Surveillance Branch, 1995–2005 Incidence file as of 01/25/08.
Mortality Source: Texas Department of State Health Services, Center for Health Statistics.

Stomach Cancer, Texas, 2001–2005

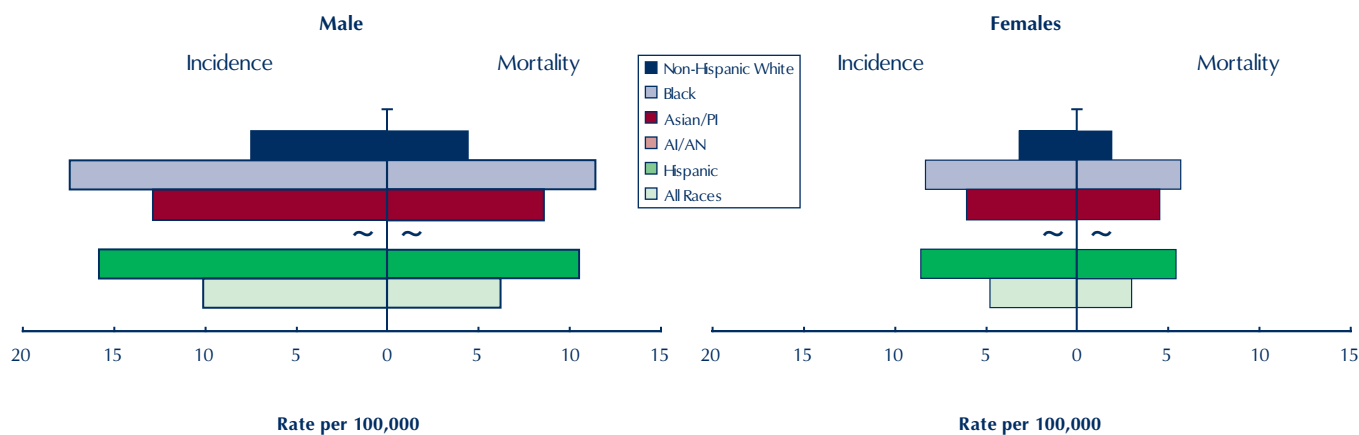
Texans Newly Diagnosed: 6,713
Highest Diagnosis Rate: Black Men

Texan Lives Lost: 4,107
Highest Death Rate: Black Men

Although there are other factors that are important in the etiology of stomach cancer, smoking has been determined to be a causal factor for many stomach cancer cases and deaths.⁽²⁾ The 5-year survival for all stomach cancers is 25%, increasing to a 5-year survival of 61% for those cases (only 24% of all cases) that are diagnosed at an early stage of disease.⁽⁷⁾

The American Cancer Society estimates that 21,500 new cases of stomach cancer were diagnosed in the U.S. in 2008, and an estimated 10,880 people died of this cancer in the same year.⁽¹⁰⁾ For Texas, it is estimated that 1,742 new cases and 983 deaths occurred in 2008. During 2001–2005, black men in Texas had the highest incidence and the highest mortality rates from stomach cancer. Among women, Hispanics had the highest incidence rate of stomach cancer, while blacks had the highest mortality. Stomach cancer incidence and mortality rates in both black and Hispanic women were more than twice as high as in non-Hispanic whites.

Figure 11. Stomach Cancer by Sex, Race, and Ethnicity, Texas, 2001–2005



~ Rate is not shown if number of cases or deaths is fewer than 16.

Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.

Incidence Source: Texas Department of State Health Services, Cancer Epidemiology and Surveillance Branch, 1995–2005 Incidence file as of 01/25/08.
Mortality Source: Texas Department of State Health Services, Center for Health Statistics.

Acute Myeloid Leukemia, Texas, 2001–2005

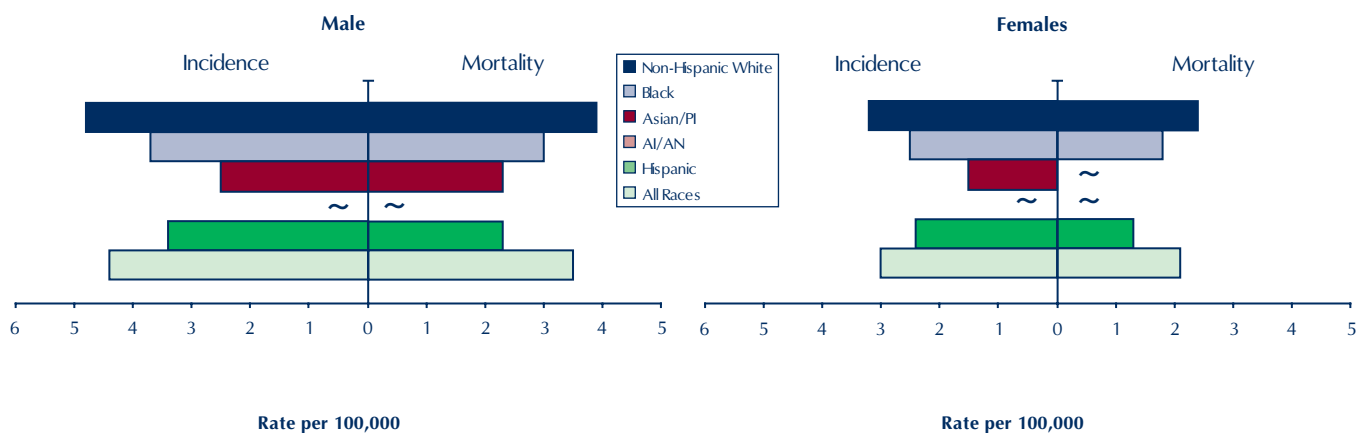
Texans Newly Diagnosed: 3,464
Highest Diagnosis Rate: Non-Hispanic White Men

Texan Lives Lost: 2,507
Highest Death Rate: Non-Hispanic White Men

Acute myeloid leukemia is the most common acute leukemia in adults and is a cancer that starts in a person's bone marrow. Smoking is considered to be causally related to acute myeloid leukemia.⁽²⁾ However, unlike some of the other tobacco-related cancers, acute myeloid leukemia is more strongly related to the cumulative effects of long-term smoking and risk does not appear to abate after tobacco cessation. It has been estimated that smoking contributes up to 58% of acute myeloid leukemia deaths.⁽²⁾ The five-year survival rate for acute myeloid leukemia is 21%, considerably lower than for other major types of leukemia.⁽⁷⁾

The American Cancer Society estimates 13,290 new cases of acute myeloid leukemia were diagnosed in the U.S. in 2008 and an estimated 8,820 people died of this cancer in the same year.⁽¹⁰⁾ For Texas, it is estimated that 784 new cases and 545 deaths occurred. Non-Hispanic white men in Texas had both the highest incidence and the highest mortality rates for acute myeloid leukemia. Among women, non-Hispanic whites also had the highest incidence and the highest mortality rates from acute myeloid leukemia.

Figure 12. Acute Myeloid Leukemia by Sex, Race, and Ethnicity, Texas, 2001–2005



~ Rate is not shown if number of cases or deaths is fewer than 16.

Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.

Incidence Source: Texas Department of State Health Services, Cancer Epidemiology and Surveillance Branch, 1995–2005 Incidence file as of 01/25/08.
Mortality Source: Texas Department of State Health Services, Center for Health Statistics.

Estimated Annual Percent Change in Rates of Tobacco-Related Cancers in Texas, 1996–2005

During 1996–2005 there were statistically significant decreases in the incidence rates of cancers of the lung and bronchus, larynx, stomach, and oral cavity and pharynx overall (Table 2). A significant decrease also occurred in cervical cancer among women. The decrease in lung and bronchial cancer was only seen in men, but there was no change in the rate for women. The decrease in laryngeal cancer was also present and statistically significant in both men and in women, as was stomach and oral cavity and pharyngeal cancer. There was no significant decrease in cancers of the esophagus or urinary bladder, or acute myeloid leukemia, but there was a significant increase in the incidence of pancreatic cancer (in men only) and in kidney cancer (in both men and women).

There was also a decrease in mortality from tobacco-related cancers in Texas from 1996–2005. This decrease was statistically significant for cancers of the lung and bronchus, larynx, stomach and oral cavity and pharynx. This decrease also occurred in males and females separately, except for the larynx in females, which declined but was not statistically significant. Most other sites of tobacco-related cancer mortality also declined but the decreases were not statistically significant (Table 3). These decreases in cancer incidence and mortality in Texas parallel the U.S., with decreases in the incidence of tobacco-related cancers since 1999,⁽¹⁾ and a decline in overall cancer mortality since 1991.^(24,25)

Additional Cancers Under Study

Research on the use of tobacco products and cancer continues. Other cancers that have been linked to tobacco use are those of the colon, rectum, and liver⁽²⁾ but there is currently insufficient evidence to conclude a causal relationship. In Texas, for the years 2001–2005, over 52,000 of these cancers were diagnosed, and over 22,000 Texans died of these diseases. Therefore, even if tobacco use only slightly increases the risk of these cancers, it would contribute a substantial number of cases to tobacco-related cancers and deaths in Texas.

Tobacco Use in Texas

In 2007, an estimated 3.3 million Texas adults, or 19.3% of the adult population, were current smokers. This is slightly lower than the national prevalence overall (19.8%) but the prevalence in Texas was higher than the national prevalence among males and lower among females (Figure 13). For 2005–2007, the highest rates of smoking were in American Indians/Alaskan Natives (40.1%), and the lowest rates in Asians/Pacific Islanders (7.2%). Non-Hispanic black, non-Hispanic white, and Hispanic males all had a similar smoking prevalence, ranging from 21.8% to 24.3%, but Hispanic females had a much lower smoking rate (9.8%) than either non-Hispanic white (16.4%) or non-Hispanic black females (21.9%) (Table 4).

Among high school students, the prevalence of smoking in 2007 was 21.1%, and 27% had used any form of tobacco in the past 30 days. The prevalence of tobacco use increases dramatically by grade level, from 18.1% in 9th grade to 39.3% in 12th grade.⁽²⁶⁾ In addition to tobacco use, almost half (46.3%) of middle and high school students in 2006 reported being in the same room as someone smoking cigarettes in the past week.⁽²⁷⁾

The social and economic impacts of tobacco use on Texans are substantial. The CDC estimates that the cost of tobacco use in Texas for 2004 was in excess of \$12 billion for direct costs and lost productivity. Approximately \$1.6 billion in health care costs were covered by Medicaid.⁽²⁸⁾ The situation is not expected to improve with rising health care costs, millions of Texas adults and thousands of Texas youth still smoking, and inadequate funding for an effective and comprehensive tobacco prevention program.⁽²⁹⁾

Table 2. Estimated Annual Percent Change (EAPC) in Incidence Rates of Tobacco-Related Cancers, Texas, 1996–2005

Cancer Site	Total EAPC	Male EAPC	Female EAPC
Lung and Bronchus	-1.1*	-2.0*	0.0
Larynx	-3.7*	-3.8*	-3.7*
Esophagus	0.0	0.2	-1.2
Stomach	-1.3*	-1.4*	-1.6*
Pancreas	0.7*	1.1*	0.4
Kidney and Renal Pelvis	3.7*	3.1*	4.3*
Urinary Bladder	-0.5	-0.6	-0.8
Cervix Uteri	-2.8*	~	-2.8*
Acute Myeloid Leukemia	1.4	1.1	1.7
Oral Cavity and Pharynx	-0.9*	-1.1*	-1.4*

APCs were calculated using weighted least squares method.

* The APC is significantly different from zero ($p < 0.05$).

~ Statistic could not be calculated.

Prepared by the Texas Department of State Health Services, Cancer Epidemiology and Surveillance Branch, Texas Cancer Registry.

Source: Texas Department of State Health Services, Cancer Epidemiology and Surveillance Branch, Texas Cancer Registry, Incidence, 1995-2005, NPCR-CSS Sub 01-31-08, SEER Pop-Adj, SEER*Prep 2.4.0

Table 3. Estimated Annual Percent Change (EAPC) in Mortality Rates of Tobacco-Related Cancers, Texas, 1996–2005

Cancer Site	Total EAPC	Male EAPC	Female EAPC
Lung and Bronchus	-1.8*	-2.6*	-0.7*
Larynx	-2.1*	-2.1*	-2.8
Esophagus	-0.6	-0.7	-0.8
Stomach	-2.6*	-2.3*	-3.5*
Pancreas	-0.3	-0.3	-0.4
Kidney and Renal Pelvis	0.2	-0.3	0.5
Urinary Bladder	-0.5	-0.7	-0.9
Cervix Uteri	-1.6	~	-1.6
Acute Myeloid Leukemia	1.4	2.0	0.7
Oral Cavity and Pharynx	-3.2*	-2.9*	-4.2*

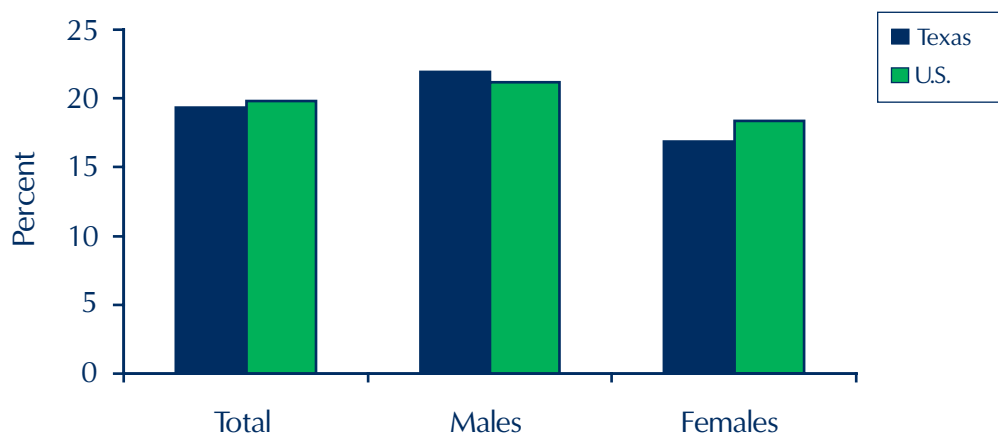
APCs were calculated using weighted least squares method.

* The APC is significantly different from zero ($p < 0.05$).

~ Statistic could not be calculated.

Prepared by the Texas Department of State Health Services, Cancer Epidemiology and Surveillance Branch, Texas Cancer Registry.

Source: Texas Department of State Health Services, Cancer Epidemiology and Surveillance Branch, Texas Cancer Registry, Mortality, 1990-2005, created 03-31-08, SEER Pop-Adj, SEER*Prep 2.4.0

Figure 13. Prevalence of Cigarette Smoking, Texas and the U.S., 2007

Cigarette Smoking: Smoked at least 100 cigarettes in entire life and now smokes on some or all days. Prevalence rates are weighted for Texas demographics and probability of selection.

Source: Texas Behavioral Risk Factor Surveillance Query System, Center for Health Statistics, Texas Department of State Health Services.
http://www.dshs.state.tx.us/chs/brfss/query/brfss_form.shtm

Table 4. Estimated Prevalence of Current Smokers, BRFSS, Texas, 2005–2007

Race	Sex	Sample Size	%	95% CI	
				Lower	Upper
Texas--All Races	Total	30,449	19.1	18.3	19.9
	Male	10,723	21.8	20.6	23.2
	Female	19,726	16.4	15.6	17.3
Non-Hispanic White	Total	18,191	19.8	18.8	20.8
	Male	6,722	21.8	20.6	23.2
	Female	11,469	16.4	15.6	17.3
Non-Hispanic Black	Total	2,219	23.0	20.4	25.8
	Male	674	24.3	19.9	29.3
	Female	1,545	21.9	19.0	25.2
Non-Hispanic Asian/ Pacific Islander	Total	425	7.2	4.7	11.0
	Male	181	9.0	5.3	14.9
	Female	244	4.5	2.2	9.0
Non-Hispanic American Indian/ Alaskan Native	Total	280	40.1	30.0	51.2
	Male	113	40.6	25.4	57.7
	Female	167	39.6	27.9	52.7
Hispanic of Any Race	Total	8,841	16.7	15.2	18.3
	Male	2,816	23.9	21.2	26.8
	Female	6,025	9.8	8.7	11.0

All reported rates are weighted for Texas demographics and the probability of selection.

Source: Texas Behavioral Risk Factor Surveillance System, Statewide BRFSS Survey, 2005–2007, Community Assessment Team, Center for Health Statistics, Texas Department of State Health Services.

Tobacco Use in Texas (continued)

According to the Federal Trade Commission (FTC) for 2005, U.S. manufacturers sold 352 billion cigarettes and gave away another 3 billion in the U.S. and to U.S. armed forces overseas. Tobacco advertising and promotional expenditures in the U.S. were \$13.1 billion.⁽³⁰⁾ At the same time, states only spent a total of \$538 million in tobacco prevention.⁽³¹⁾

For Texas, it is estimated that tobacco companies spent \$885 million dollars in promotional marketing in 2008.⁽³²⁾ In contrast, for FY2009 Texas spent \$12.6 million on tobacco prevention, which is less than 5% of what the Centers for Disease Control and Prevention (CDC) recommends for Texas using best practices in comprehensive tobacco control.^(29,33) Texas ranks 46th among the states in the funding of tobacco prevention programs and spends less than 1% of the \$2 billion in tobacco-generated revenue the state collects each year in tobacco settlement payments and tobacco taxes, on these programs.⁽²⁹⁾

Adequately funded comprehensive tobacco control programs have been found to be extremely effective in producing substantial reductions in tobacco use and help prevent youth from initiating tobacco use. California's long running comprehensive tobacco control program has been credited with reducing the prevalence of tobacco use among adults 10%, from 23% to 13%. Importantly, the incidence rate of lung cancer in California has declined at a rate four times faster than the rest of the U.S.⁽³⁴⁾

Summary

Tobacco use remains the leading preventable cause of death and disease in the U.S. and Texas and is a major risk factor for a number of cancers that affects thousands of Texans each year. In 2005, 16,267 Texans died and another 27,788 were diagnosed with a tobacco-related cancer. Although not all of these cases and deaths can truly be attributed to tobacco use or secondhand smoke, as the primary cause of many of these cancers, tobacco use contributes to the vast majority. Significant health disparities also exist, with black men and women in Texas experiencing a disproportionate amount of the tobacco-related cancer burden. Overall, blacks in Texas experienced the highest incidence rates for 5 and the highest mortality rates for 7 of the 10 tobacco-related cancers.

Although much is known about the significant social and economic toll, tobacco use remains a significant public health problem in Texas. Ten years after the Texas Tobacco Settlement, smoking rates remain high among high school students and young adults, well above the national targets.⁽³⁵⁾ Adequately funded comprehensive tobacco prevention programs, which address smoke-free policies, smoking cessation and prevention of tobacco initiation among youth, have shown to be extremely effective and are needed to meet tobacco reduction goals.

Technical Notes

Sources of Data

The Texas Cancer Registry (TCR) is a population based cancer surveillance (reporting) system that includes incident reports of certain benign, borderline, in-situ, and malignant neoplasms occurring in Texas among state residents. The TCR was first established in 1986, but statewide, population-based reporting of newly diagnosed cancer cases was not fully implemented until 1995. Regional offices cover the entire state and assist with data collection and record processing.

Texas hospitals and cancer treatment centers are the primary sources of case reporting. Reports also are received from outpatient clinics, free-standing pathology labs, and other state central cancer registries when a Texas resident is diagnosed or treated at a facility outside of Texas. The data used in this report were primarily abstracted from medical records and pathology reports.

Cancer mortality data for 2001–2005 were extracted from electronic files provided by the DSHS, Center for Health Statistics, and collected by the Texas DSHS Vital Statistics Unit. These files contained demographic and cause of death information from Texas death certificates for all deaths occurring among Texas residents.

Classification by Anatomic Site

Primary anatomic site and histologic type were coded for each cancer incident case using the International Classification of Diseases for Oncology (ICD-O). For all cases in this report, the third edition was used (ICD-O-3).⁽³⁶⁾ SEER program site recode groups for classifying types of cancer were recoded using SeerPrep version 2.4.0 software. The SEER Site recodes for ICD-O-3 used in this report are presented in Appendix I, from the SEER website: (http://seer.cancer.gov/siterecode/icdo3_d01272003/, obtained 9/15/2006).

For cancer mortality, the TCR classifies anatomic site according to the SEER Cause of Death Recode, as given by the SEER Cause of Death Recode 1969+ (9/17/2004) (Appendix 10) (http://seer.cancer.gov/codrecode/1969+_d09172004/index.html). For reporting of cancer mortality data, SEER has defined major site groups based on the ICD version 10.⁽³⁷⁾ These site groups are defined consistently across time to facilitate reporting of long term trends, with earlier versions of ICD used for deaths prior to 1999.

Cancer deaths were recoded into SEER program site groups for classifying sites of cancer using SeerPrep version 2.4.0 software. The use of these cancer site groupings follows national cancer standards, and allows Texas cancer mortality data to be compared directly.

Classification by Race and Ethnicity

Race and ethnicity information for cancer cases is based primarily on information contained in the patient's medical record. This information may be supplied directly by the patient, may be determined by admissions staff or other medical personnel, and/or can be based on last name, race or ethnicity of parents, birthplace, or maiden name. The reporting of race or ethnicity may be influenced by the race and ethnic distribution of the local population, by local interpretation of data collection guidelines, and other factors. It is possible that some differences in race and ethnic-specific rates reflect biases of classification rather than true differences in risk.

The race and ethnicity of each cancer patient is classified according to the categories defined in the North American Association of Central Cancer Registries (NAACCR) Standards for Cancer Registries Volume II: Data Standards and Data Dictionary.⁽³⁸⁾ Classification of Hispanics for incidence data is based on NAACCR Hispanic Identification

Technical Notes (continued)

Algorithm (NHIA). The race groups used in this report for generating incidence and mortality rates include the following categories: non-Hispanic white, black, Asian/Pacific Islander, American Indian/Alaskan Native and Hispanic. The Hispanic designation can be of any race, but in 2001–2005, 97.3% of Hispanics in Texas diagnosed with cancer were of the white race. Unless persons of unknown race are coded as Hispanic, (only 1.9% in 2001–2005) they are not included in any of the race or ethnic categories, but are still included in the total for All Races. Therefore, the four categories provided in this report (non-Hispanic white, black, Hispanic, Asian/Pacific Islander, American Indian/Alaskan Native) will not sum to the total for All Races.

Mortality data are provided by these same categories, but the Hispanic designation is based on the death certificates Hispanic origin question, which is answered by the informant. The informant may be next of kin, friend, funeral director, attending physician, medical examiner, justice of the peace, or other source. The above classification methods are consistent with methods used by other states and national organizations.

Confidentiality

Protecting the confidentiality of persons whose cancers are reported to the TCR is the highest priority of the Registry in all aspects of operations, and required by state law and rule (Health and Safety Code, §82.009; Texas Administrative Code, Title 25, Part I, Chapter 9I, Subchapter A). No data presented in this report are intended to be used to identify individuals who have been diagnosed with cancer.

Data Quality

The Texas Cancer Registry employs multiple procedures to assure the quality of incoming data, and these are described in the Texas Cancer Registry Cancer Reporting Handbook,⁽³⁹⁾ distributed to all cancer reporters in the state. Numerous quality assurance procedures were applied to the data based on SEER, NPCR, NAACCR, and TCR standards. Quality control included both internal and external processes to insure the reliability, completeness, consistency, and comparability of TCR data. Examples of internal consolidation and quality assurance processes include 1) a review of multiple abstracts on the same patient for multiple primaries, 2) identifying possible duplicate records, 3) correcting unacceptable codes or inter-field inconsistencies, and 4) reviewing unusual code combinations for site/sex, age/site, age/morphology or site/morphology. Inconsistencies and unknown values for date of birth, race, ethnicity, sex, county of residence, date of diagnosis, site, and histologic type were rectified to the greatest extent possible.

External procedures included training of reporting facility staff, on-site case-finding, and re-abstracting studies. Cancer death certificate files were also matched against reported incident cases for an additional reporting completeness check. To further assist identifying any cancer cases not reported to the TCR, information on all death certificates with the underlying cause of death due to a malignant neoplasm were obtained from the Center for Health Statistics, Texas Department of State Health Services (DSHS). Institutions listed on the death certificates as the place of death were queried for additional cancer case information. Missed cases not identified from any institution were added to the cancer database as “death certificate only” (DCO) cases. These DCO cases for which the only available information is from the death certificate, were included in this report.

Data Analysis

Texas Cancer Registry cancer incidence and mortality analysis files are created using NCI SEER*Prep software (version 2.4.0). Calculation of incidence and mortality rates are done using SEER*Stat software (version 6.4.4). This software was developed by the NCI SEER program to analyze population-based cancer registry data, and provides the age-adjusted incidence and mortality rates for a standard set of cancer sites and site groups. More detailed informa-

Technical Notes (continued)

tion regarding availability and use of this software can be found on the SEER web site: <http://seer.ims.nci.gov/Scientific Systems>.

Estimates of the population used for the calculation of rates were obtained from the SEER (Surveillance, Epidemiology and End Results) program. The Texas population distribution in 2001–2005 by race and ethnicity includes non-Hispanic whites, with 50.9% of the total population and Hispanics (of any race) comprised 33.1%. Blacks in Texas comprised 11.9% of the total population, followed by Asians/Pacific Islanders (3.4%) and American Indian/Alaskan Natives (0.7%),. Population-at-risk data used in the calculation of age-adjusted rates were provided by the NCI SEER Program for use with SEER*Stat software, based on the U.S. census, for all states in the United States, by year, and by county (<http://seer.cancer.gov/popdata/index.htm>). Average annual cancer incidence and mortality rates (2001–2005) were age-adjusted using the direct method, and five-year age groups up to age 85+. Age-adjustment enables the direct comparison of incidence or mortality rates by eliminating the effect of differences in the age-distributions between various comparison populations. Direct standardization weights the age-specific rates for a given sex, race, ethnicity, or geographic area by the age distribution of the standard population. The 2000 United States standard million population was used as the standard for all calculations.

Incidence data in this report are based on Texas resident primary cancer cases and diagnosed from January 1, 2001 through December 31, 2005. Case reporting for 2001–2005 was estimated to be over 98.3% complete at that time. However, additional cases diagnosed during this time period will continue to be reported and included in the TCR analytic database. As a result, future analyses which include 2001–2005 data will vary slightly from this publication in the number of cancer cases included.

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About the Texas Cancer Registry

The Texas Cancer Registry (TCR) is a statewide population-based registry that serves as the foundation for measuring the Texas cancer burden, comprehensive cancer control efforts, health disparities, progress in prevention, diagnosis, treatment, and survivorship, as well as supports a wide variety of cancer-related research. These priorities cannot be adequately addressed in public health, academic institutions, or the private sector without timely, complete, and accurate cancer data.

The TCR is the 4th largest cancer registry in the United States, and currently meets the National Program of Central Cancer Registries, Centers for Disease Control and Prevention high quality data standards and is Gold Certified by the North American Association of Central Cancer Registries.

The ultimate goal and purpose of the TCR is to collect and disseminate the highest quality cancer data that will contribute towards cancer prevention and control, improving diagnoses, treatment, survival, and quality of life for all cancer patients.

Our mission is to collect data that significantly contribute to the knowledge of cancer for use in reducing the Texas cancer burden.

We strive to:

- Maintain a high quality nationally certified statewide population-based cancer registry with complete, timely and accurate data.
- Meet the data needs of Texans, including healthcare practitioners, cancer researchers, health planners, advocacy groups, the public, and other local, state, and national entities.
- Make a significant contribution to the fight against cancer.

The TCR consists of a central office and seven regional offices. Approximately 200,000 reports of cancer are received annually from over 500 hospitals, cancer treatment centers, ambulatory surgery centers, and pathology laboratories located throughout the state. Of these reports, over 12,000 are for out-of-state residents, largely due to the internationally recognized cancer care available in this State. These reports are distributed throughout the U.S. to other state cancer registries as a way of contributing to the overall national cancer surveillance system.

The TCR collects information such as the types of cancers that occur and their locations within the body, the extent of cancer at the time of diagnosis (disease stage), the kinds of first course treatment that patients receive, length of survival, and patient characteristics. These data are reported from various sources, including hospitals, cancer treatment centers, ambulatory surgery centers, pathology laboratories, and physician's offices, as well as supplemented through various data sharing efforts with other government data collection systems, such as vital statistics.

The TCR first met national Centers for Disease Control "high quality" data standards in 2004, and North American Association of Central Cancer Registry Gold certification in 2006. Although these national data standards continue to be met, the long-term vision of the TCR is to collect and provide data that are equivalent in timeliness, completeness, and quality as those of the National Cancer Institute, Surveillance and Epidemiology End Results Program (SEER) registries.

TCR data are available in a variety of publications and formats at the state, regional, and local community levels. To review or request TCR data, visit: <http://www.dshs.state.tx.us/tcr/>, call 1-800-252-8059 (in Texas), 512-458-7523 (outside of Texas), or e-mail CancerData@dshs.state.tx.us.